IMAGINING
the possibilities.
MAKING THEM HAPPEN.

Indiana
Department of Education

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ISTEP+ Grade 10 Mathematics
Part 1: Applied Skills
Item Samples

Math Assessment Resources

- http://www.doe.in.gov/assessment
  - Testing Windows
  - Indiana Assessment Program Manual
  - Blueprints
  - Instructional and Assessment Guidance
  - Item Samplers
  - Rubrics
  - Experience Opportunity

Scoring

- Constructed-Response
  - Content: 2 points
  - Process: 2 points
- Extended-Response
  - Content: 3 points
  - Process: 3 points

Important Process Standards

- PS.1: Make sense of problems and persevere in solving them
- PS.2: Reason abstractly and quantitatively
- PS.3: Construct viable arguments and critique the reasoning of others
- PS.5: Use appropriate tools strategically
- PS.6: Attend to precision

Example Constructed-Response Grade 10

Melanie is buying professional outfits for her new job. She has $300 dollars budgeted to spend on the new outfits. Pants cost $25 each. Skirts cost $32 each. Blouses cost $28 each. Sales tax in Indiana where she plans to purchase her outfits is 8%.

Part A

Write an inequality that would represent the number of each item she could purchase including sales tax and still stay within her budget. Be sure to define the variables you are using for your inequality.

Define the variables: _____

Inequality: _____

Part B

She plans to purchase at least three pairs of pants, at least two skirts and at least five blouses. She wants to use various combinations of pants, skirts and blouses to make outfits to wear for each day of the week. Can Melanie make her purchase and stay within her budget? Use words, numbers, and/or symbols to justify your answer.

Show All Work

Answer _____

Example Constructed-Response Grade 10

Process Standards: 1, 2, 3, 4, 5 and 6 Item Type: Constructed-Response 4 Points Total: 2-Content, 2-Process DOK: 3 Calculator: Yes	**Content Standard:** AI.L.2: Represent real-world problems using linear equations and inequalities in one variable and solve such problems. Interpret the solution and determine whether it is reasonable.

Exemplary Response:

Let ***p*** represent the total number of pants purchased,
Let ***s*** represent the total number of skirts purchased,
Let ***b*** represent the total number of blouses purchased

$$(25p + 32s + 28b) \cdot 1.08 \leq 300$$

Or other valid equation and definition of the variable

AND

No

Example Constructed-Response Grade 10

Sample Process

$(3 \cdot 25 + 2 \cdot 32 + 5 \cdot 28) \cdot 1.08 = 301.32$

$301.32 > 300$ *So, No, she cannot make her purchase*

Or other valid process

Sample Extended-Response
Grade 10

Zach has a basic cell phone plan that does not include texting. He is going to add a multimedia texting package to his cell phone plan. He has two choices of multimedia texting packages, A and B. Package A charges $0.25 per multimedia text with no monthly fees for the multimedia texting package. Package B charges $0.20 per multimedia text, but has a $15 monthly fee for the multimedia texting package.

Part A

Write an equation that represents the total cost for each multimedia texting package if any amount of multimedia texts are sent. Be sure to define the variables you are using for your equation.

Define the variables: _____

Package A Equation: _____

Package B Equation: _____

Sample Extended-Response
Grade 10

Part B

How many multimedia texts will Zach have to send each month for the two multimedia texting packages to be the same cost? Use words, numbers, and/or symbols to justify your answer.

Show all Work

Answer _____ texts

Sample Extended-Response
Grade 10

Part C

Zach plans to send 250 multimedia texts each month. Which multimedia texting package would be the least expensive package for Zach to add to his cell phone plan? Show all work using words, numbers, and/or symbols to justify your answer.

Show all Work

Answer _____

Sample Extended-Response
Grade 10

Process Standards: 1, 2, 3, 4, and 7 Item Type: Extended-Response 6 Points Total: 3-Content, 3-Process DOK: 3 Calculator: Yes	**Content Standard:** AI.SEI.3: Write a system of two linear equations in two variables that represents a real-world problem and solve the problem with and without technology. Interpret the solution and determine whether the solution is reasonable.

Exemplary Response:

Let ***C*** represent the Total Cost of the Multimedia Texting Package,
Let ***t*** represent the number of multimedia texts sent

$Package\ A:\ C = .25t$
$Package\ B:\ C = .20t + 15$

Or other valid equation and definition of the variable

AND

300

Sample Extended-Response
Grade 10

AND

Package A

Sample Process:

$C = .25t$

$C = .20t + 15$

$.25t = .20t + 15$

$.05t = 15$

$t = \frac{10}{.05}$

$t = 300$

Or other valid process

Sample Extended-Response
Grade 10

Since at 300 multimedia texts the plans are the same, and since Zach only plans on sending 250 multimedia texts, the plan with no monthly charges would be the least expensive plan.

Or

$$C = .25t$$
$$C = .25 \cdot 250$$
$$C = 62.5$$

$$C = .20t + 15$$
$$C = .20 \cdot 250 + 15$$
$$C = 65$$

Or other valid process

Final Notes

- Responses outside of the given lines
- Scoring multiple-part items
- Grammar and spelling

Questions??

- Office of Student Assessment
  - www.doe.in.gov/assessment
  - INassessments@doe.in.gov
  - 317-232-9050